

incubating the solution at a temperature less than 90° C for a period of time;

wherein the metal salt concentration, volume ratio of organic solvent to water, temperature, and time are selected to provide a sol or a gel having desired characteristics;

wherein the sol or the gel is capable of forming a coating;

wherein the volume ratio of organic solvent to water ranges from about 1/1 to 10/1; and

wherein nanosized particles are produced;

wherein the time ranges from about one minute to about 72 hours.

19. (Amended) A method of sol-gel processing using an inorganic metal salt and a mixed solvent system, comprising:

preparing a solution including an inorganic metal salt, water, and an organic solvent having a metal salt concentration and a volume ratio of organic solvent to water;

incubating the solution at a temperature less than 90° C for a period of time;

wherein the metal salt concentration, volume ratio of organic solvent to water, temperature, and time are selected to provide a sol or a gel having desired characteristics;

wherein the sol or the gel is capable of forming a coating;

wherein the volume ratio of organic solvent to water ranges from about 1/1 to 10/1; and

wherein nanosized particles are produced;

wherein the time ranges from about one minute to about 72 hours;

wherein the temperature ranges from about 20 °C to about 25 °C and wherein nanosized particles are produced.

20. (Amended) A method of sol-gel processing using an inorganic metal salt and a mixed solvent system, comprising:

preparing a solution including an inorganic metal salt, water, and an organic solvent having a metal salt concentration and a volume ratio of organic solvent to water;

incubating the solution at a temperature less than 90° C for a period of time;

wherein the metal salt concentration, volume ratio of organic solvent to water, temperature, and time are selected to provide a sol or a gel having desired characteristics;

wherein the sol or the gel is capable of forming a coating;

wherein the volume ratio of organic solvent to water ranges from about 1/1 to 10/1; and

wherein nanosized particles are produced;

wherein the time ranges from about one minute to about 72 hours;

wherein the temperature ranges from about 20 °C to about 25 °C and wherein monodispersed particles are produced.

22. (Twice Amended) A method of producing nanosize particles using an inorganic metal salt and a mixed solvent system, comprising:

preparing a solution including an inorganic metal salt, water, and an organic solvent having a metal salt concentration and a volume ratio of organic solvent to water;

incubating the mixture at a temperature less than 90°C for a period of time;

wherein the metal salt concentration, volume ratio of organic solvent to water, temperature, and time have been manipulated to provide primary particles in the solution having a diameter of about 10 nm to about 100 nm;

wherein the primary particles are capable of forming a sol-gel coating; and

wherein the volume ratio of organic solvent to water ranges from about 1/1 to 10/1;

wherein the time ranges from about one minute to about 72 hours.

34. (Twice Amended) A method of producing a sol from an inorganic metal salt at room temperature comprising:

preparing a solution including an inorganic metal salt, water, and an organic solvent having a metal salt concentration and a volume ratio of organic solvent to water;

incubating the solution at room temperature for a period of time;

wherein the metal salt concentration, volume ratio of organic solvent to water, and time are selected to provide a sol having desired characteristics;

wherein the sol is capable of forming a coating;

wherein the volume ratio of organic solvent to water ranges from about 1/1 to about 10/1; and

wherein the sol contains nanosized particles;

wherein the time ranges from about one minute to about 72 hours.

43. (Twice Amended) A method of producing monodispersed particles at room temperature, comprising:

preparing a solution including an inorganic metal salt, water, and an organic solvent having a metal salt concentration and a volume ratio of organic solvent to water;

incubating the solution at room temperature for a period of time;

wherein the metal salt concentration, volume ratio of organic solvent to water, and time are selected to provide a sol having desired characteristics;

wherein the sol is capable of forming a coating;

wherein drying the sol to produce a powder of monodisperse particles; and

wherein the volume ratio of organic solvent to water ranges from about 1/1 to about 10/1;

wherein the time ranges from about one minute to about 72 hours.